Physically-Based Simulation
Final Presentation: Rube Goldberg Machine

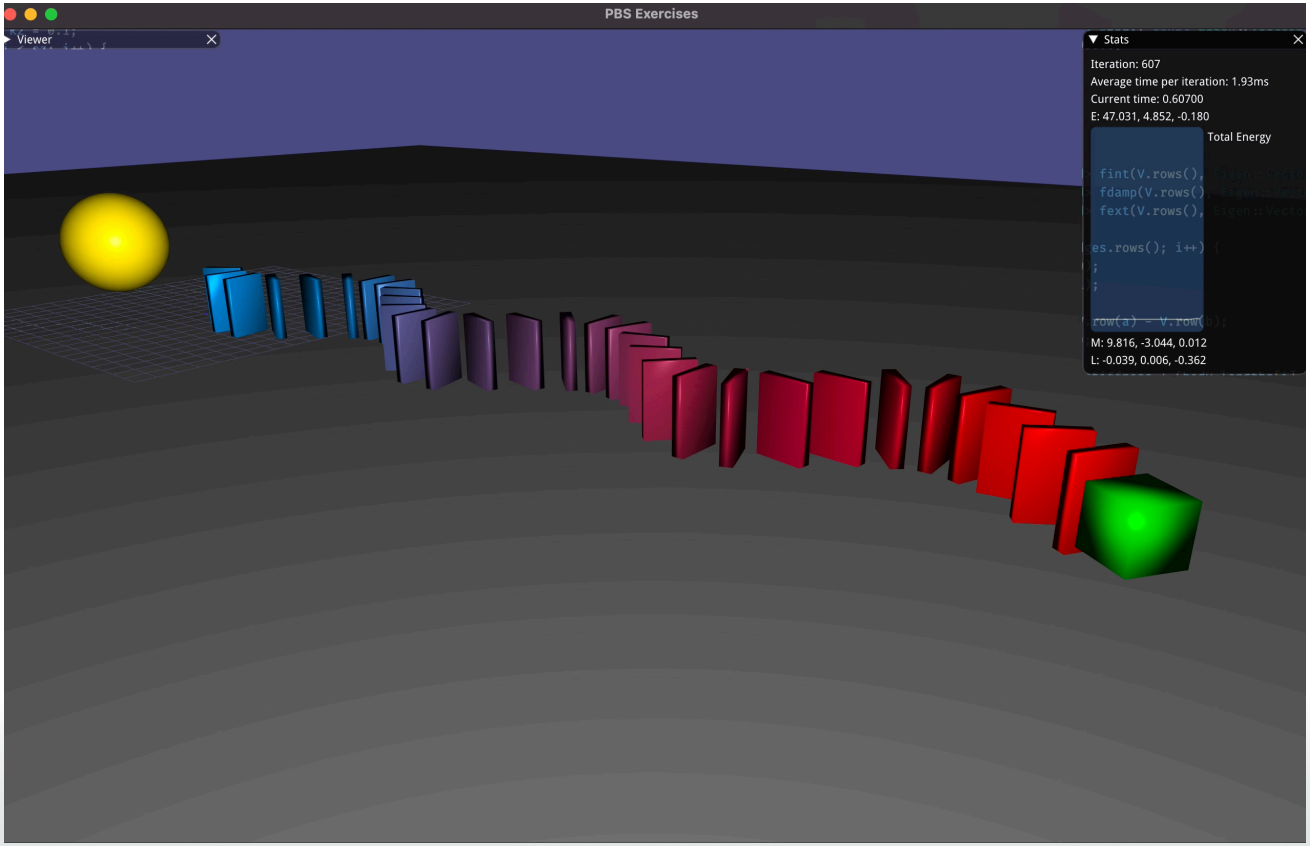
Group 19

Renato Semadeni

Simulation Methods

- Rigid Body Simulation
  - Sweep and Prune
  - GJK
  - EPA
- Baraff's Paper for Contact Forces and Friction
- Semi-Implicit Euler

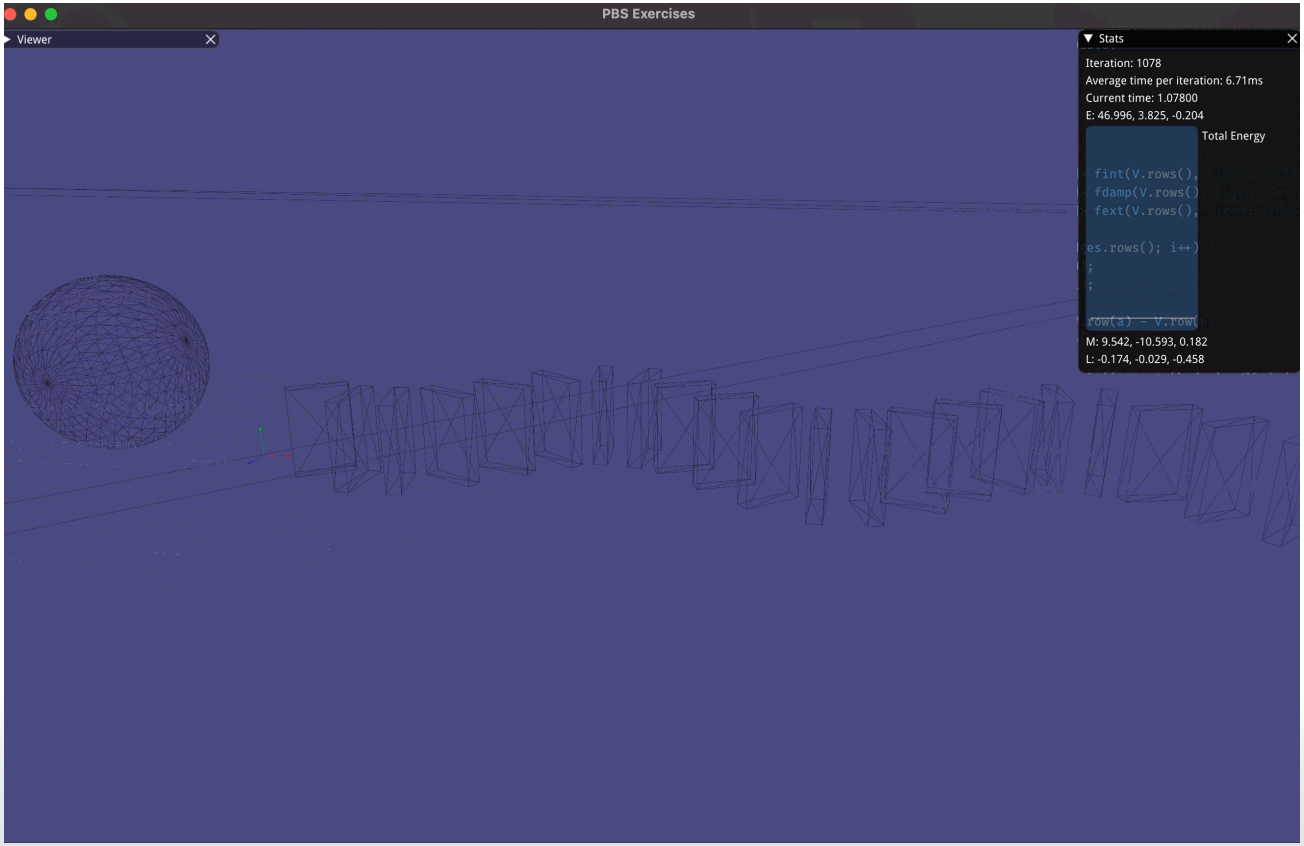
Current State



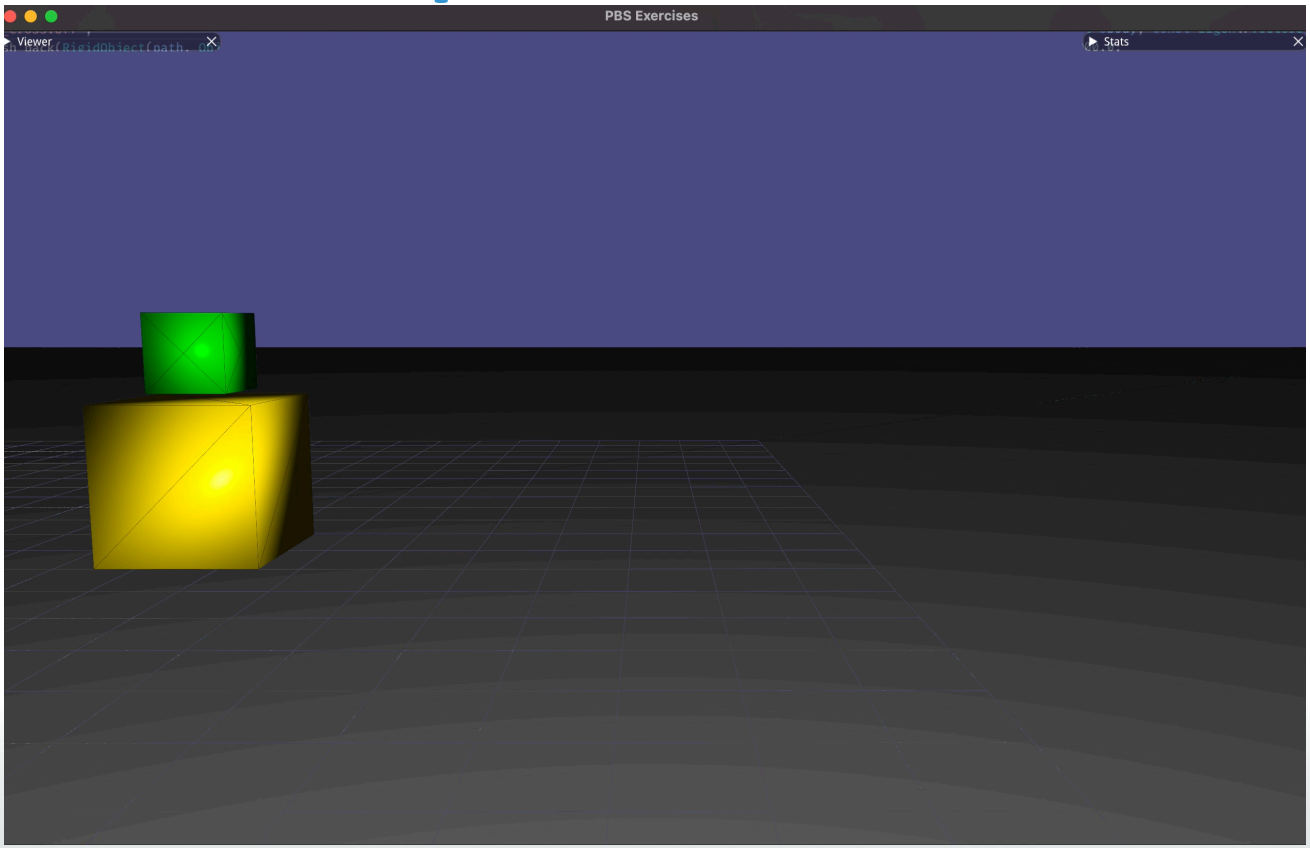
Achieved Milestones

1. put the objects on the screen ✔
2. add basic motion (falling domino stones) ✔
3. introduce multiple objects ✔
    1. Contact Force
    2. Simplistic Friction
4. connect basic sequence ✔
5. add soft body parts ✘ (not yet finished)
6. adding fluid effects

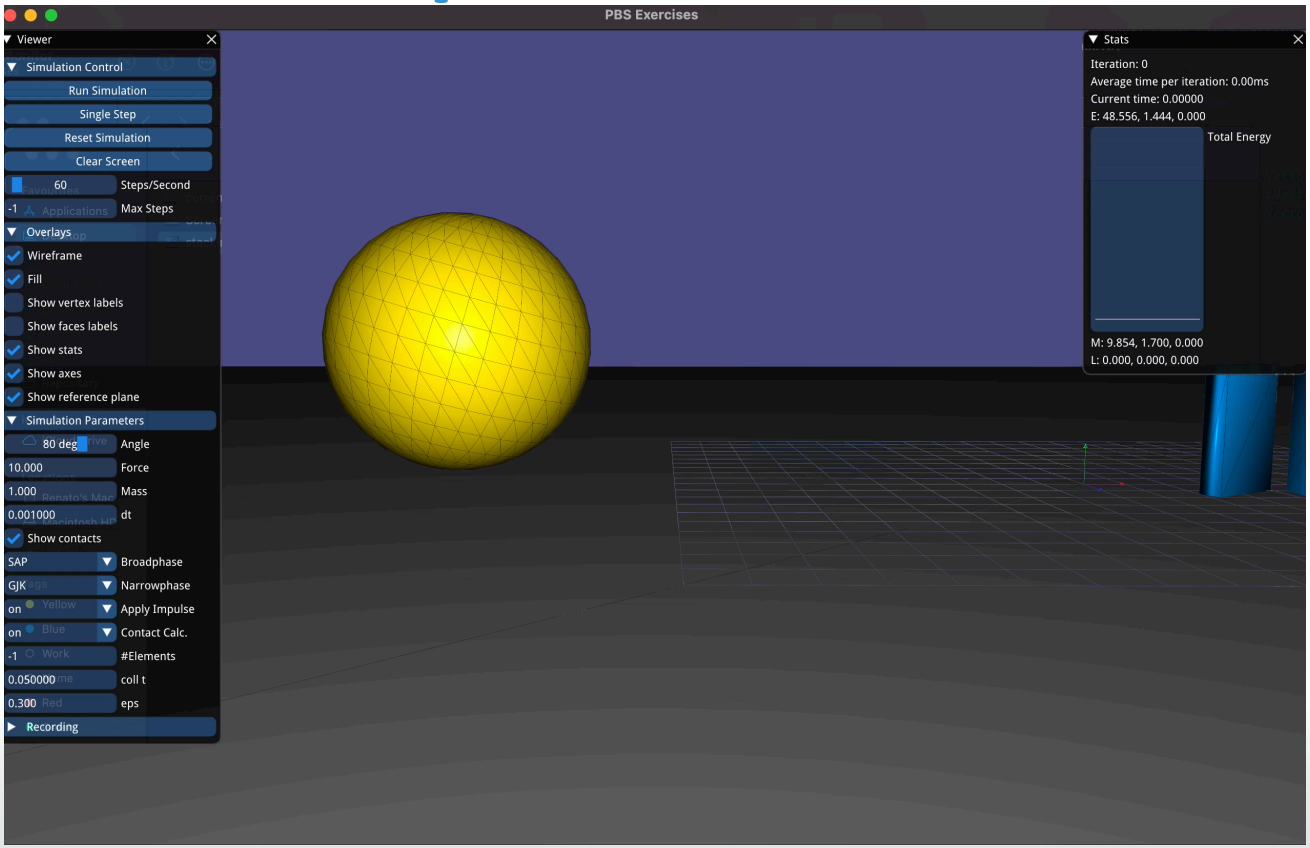
Collision and Contact Detection



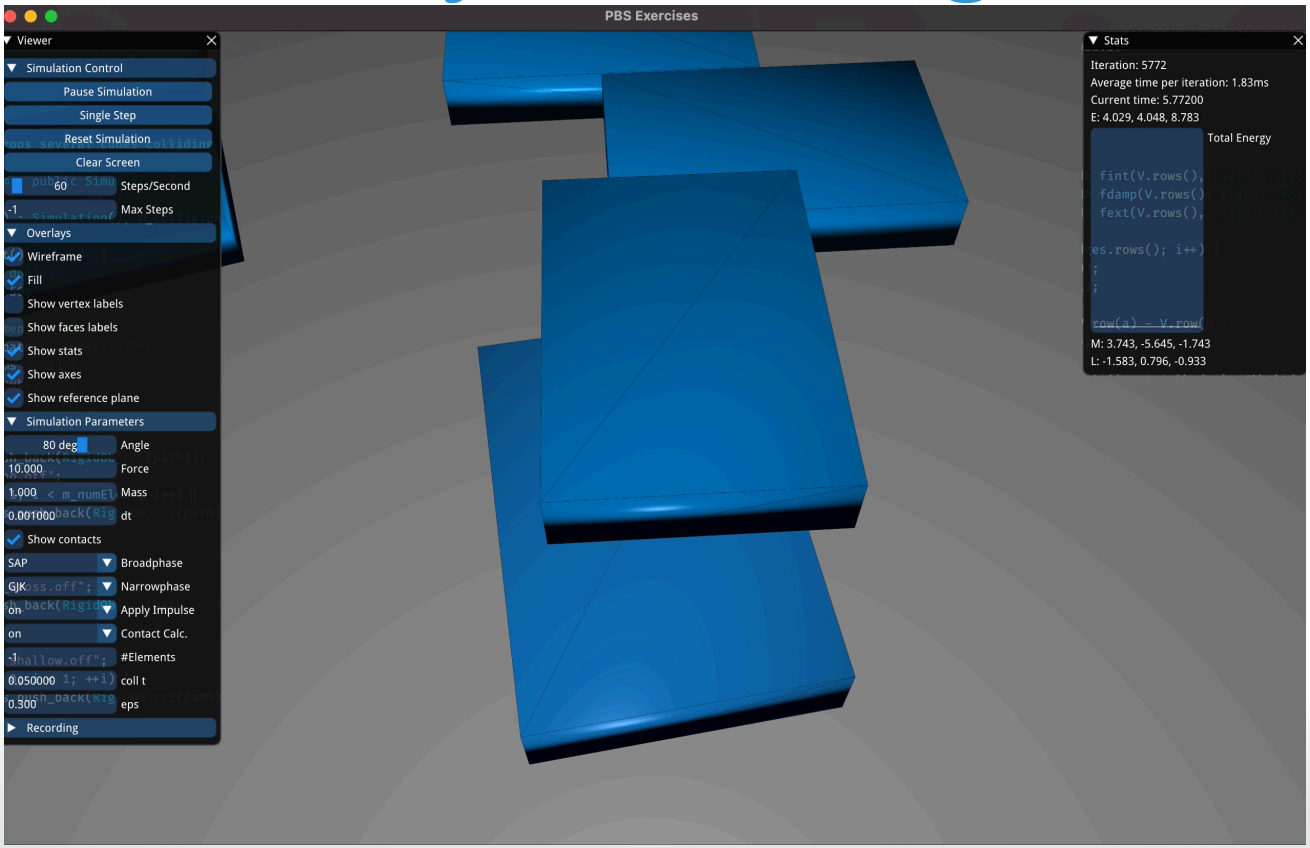
Simplistic Friction



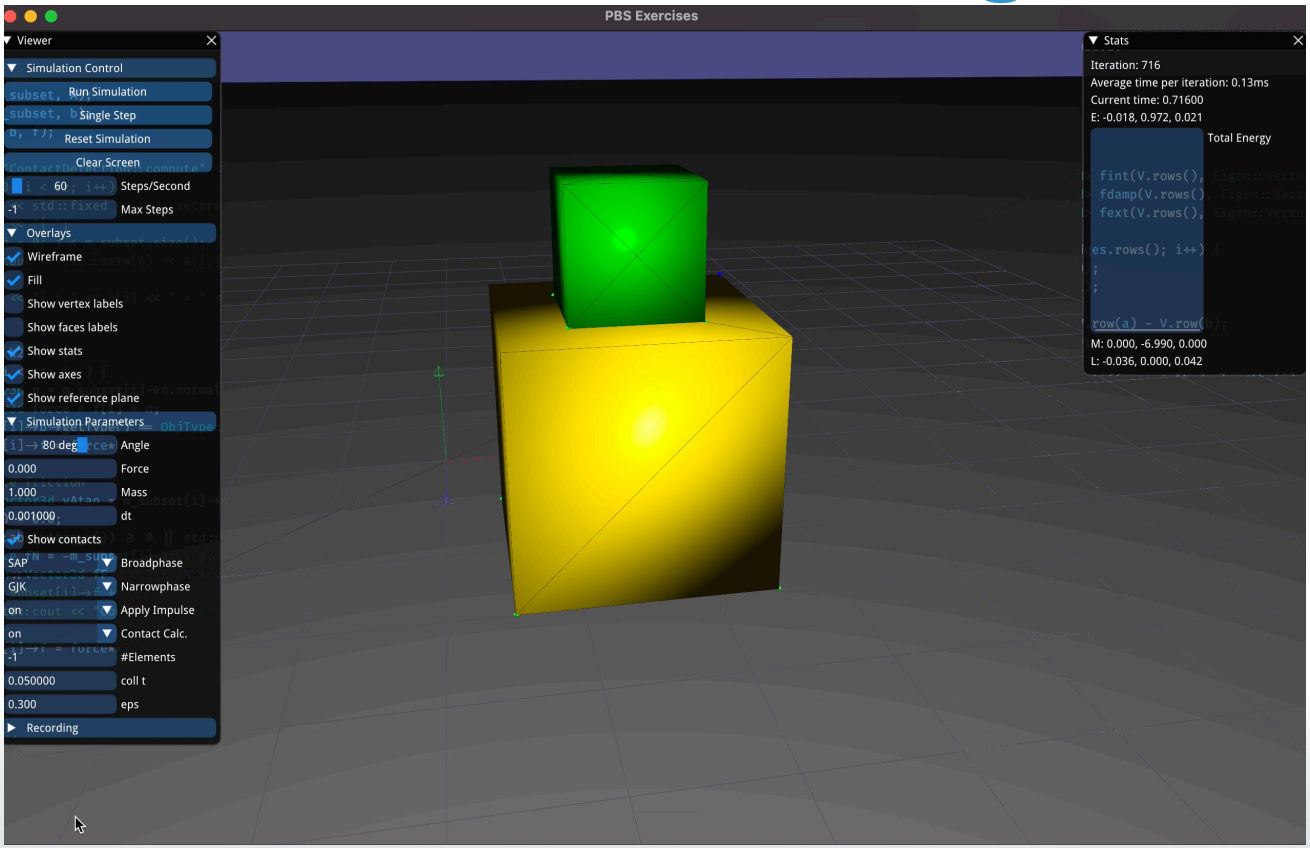
Simplistic Friction



Object stacking



Isolated Stacking

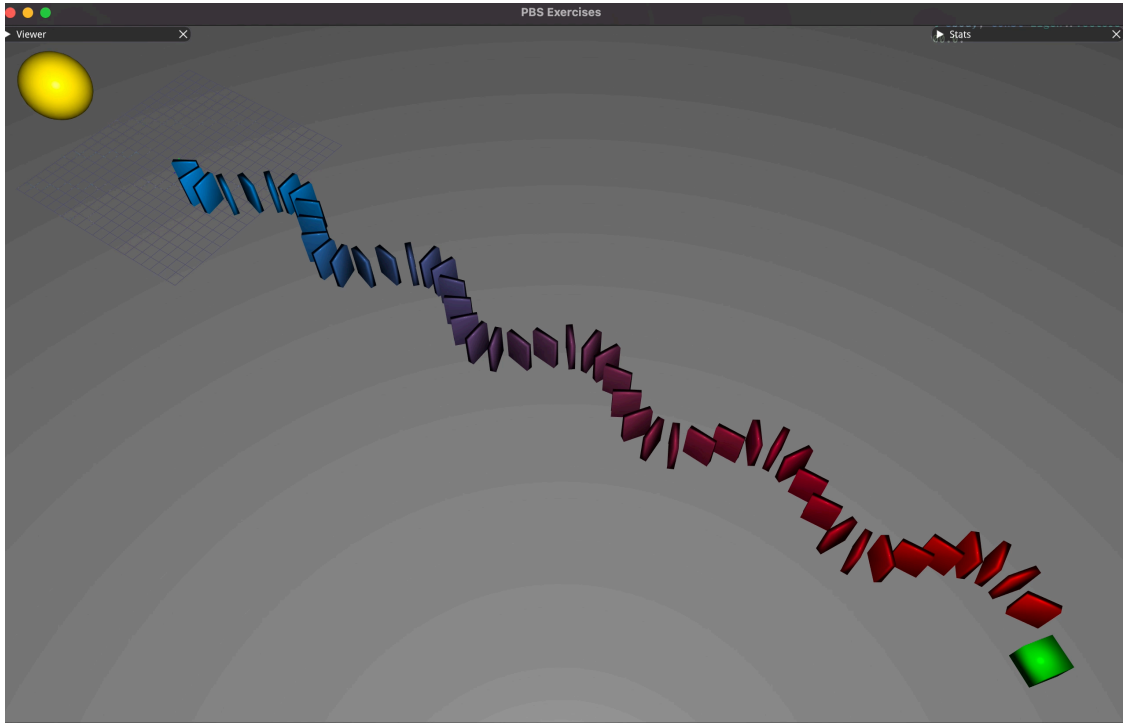


Open & Remaining Issues

- Rigid Body Simulation
  - Static and Dynamic Friction
  - Object Stacking
- Soft Body Element
  - Helper Classes implemented, but no used so far

Summary

- Stability
  - Problems with stacking
  - Simplistic Friction induces energy
- Performance
  - Realtime
  - Not optimized



Questions?